

SUPPLEMENT TO NO_x BACT ANALYSIS

TECHNICAL SUPPORT FOR PERMIT MODIFICATION APPLICATION

CALCINERS A & B FUEL SWITCH

The Solvay permit application AP-0631 contains a summary of control technology selections from the RACT, BACT, LAER Clearinghouse (RBLC) in early 2002, and includes determinations for non-boiler facilities fired on coal or an unspecified fuel. This supplement provides an updated summary as of March 2003, using slightly different filters, and addresses only the determinations for control technologies considered “technically infeasible” in the Solvay application. This updated summary contains the NO_x control technology selections from January 1993 to the present (past 10 years) for coal and unlisted fueling, and all processes under the categories of kilns, calciners, furnaces, and dryers. (The previous analysis included some petroleum refinery processes, which are categorically excluded herein, because the fueling was never by coal.)

The attached flow chart entitled “EPA RBLC for NO_x” depicts the process followed to determine NO_x controls for coal-fired kilns, calciners, dryers, and furnaces. A search for NO_x controls on all kilns, calciners, dryers, and furnaces was conducted, and then all draft determinations and duplicates were removed. The data was further segregated into coal fueling and unspecified fueling. Coal fueled units have unique burner and exhaust stream conditions that affect the feasibility of NO_x controls. They are susceptible to slagging, and have both particulates and some sulfur in the exhaust gas.

The two final summary tables of the workbook are presented below. Table 1 is a summary of RACT, BACT, or LAER (RBL) determinations for kiln, calciner, furnace, and dryers specified as fueled with coal. Table 2 is a summary of the same process units with no fuel specification. It would be necessary to obtain the permit or contact the issuing agency to determine the fuel type for sources listed in Table 2. The details of these determinations are attached and entitled “Coal-Fired Sources: Kilns, Calciners, Dryers, Furnaces” and “Unspecified Fuel – Sources: Kilns, Calciners, Dryers, Furnaces”.

Table 1

RBLC NO_x Control Determinations for Kilns, Calciners, Dryers, and Furnaces Fueled with Coal

Listed NO _x Control Technology	Number of Determinations
Good combustion practices	3
Process design	7
Flue gas recirculation	2
Low-NO _x burner	3
SNCR	0
SCR	0
None listed	5
Total	20

Table 2
RBLC NO_x Control Determinations for Kilns, Calciners, Dryers, and Furnaces with no Fuel Specified

Listed NO _x Control Technology	Number of Determinations
Good combustion practices	15
Process design	9
Flue gas recirculation	1
Low-NO _x burner	29
SNCR	2
SCR	1
None listed	22
Total	79

Of the 20 coal fueled sources listed in Table 1, ten had no add-on controls; three reported good combustion practices and seven reported process design. Process design includes use of pre-heater towers, burner temperature control, and improvement through design technologies. The RotoGrate Stoker coal combustion system proposed in this permit application has process designs to control NO_x emissions. Tight grates and air seals allow accurate control of the air flow to the grate surface and results in lower excess air. The overfire air (OFA) system is staged for thorough mixing of the fuel gases and combustion air in the furnace. These process design parameters result in lower NO_x. There were three determinations listed in Table 1 as low-NO_x burners, which are assumed to be installed on devices where they were determined to be feasible. Low-NO_x burners are generally associated with pulverized coal systems, which have been determined to be “infeasible” for Solvay’s application. There were two cases of flue-gas recirculation (FGR), which Solvay considers “feasible” and proposes to install as a NO_x control. There were no determinations of SCR or SNCR, and there were five designations with no control listed.

Table 2 represents sources with unknown fueling and attention is focused only on the determinations which Solvay has determined to be infeasible, which are low-NO_x burners, SCR and SNCR. Low-NO_x burners are ruled as infeasible as noted in the paragraph above. The SCR system is infeasible for Solvay because there is no location in the process where gas conditions are appropriate for its installation (particle-free gas and temperature above 700 F.)

The two SNCR cases are NV-0032 1995 and IA-0027; both permits were issued in 1995. For the Nevada (Clark County) determination, Mr. Steve Dayo (702-455-1675) was contacted on March 19, 2003. This is the Great Star Cement Corporation facility, which was never built, and the permitting records are not readily available (archived). Mr. Dayo recalled that the plant was to be fueled on natural gas and that the SNCR determination was ultimately ruled as “infeasible.” Regardless, with natural gas fueling, the facility is not an appropriate category for comparison with the Solvay coal-fired furnaces.

The second facility with an SNCR determination is for an Iowa flat glass melting furnace and curtain coating system at a glass factory. According to the permit, the facility is gas-fired. Furnace operating temperatures are between 2,000°F and 3,000°F (from generic glass furnace information) with outlet

temperatures about 900°F (from the permit), which is well into the temperature range for an ammonia or urea NO_x reduction reaction. Although the permit specified SNCR, a permit engineer (Karen Kuhn, 515-281-4306) recalls that the facility ultimately reached its specified emission limit with FGR and low-NO_x burners. Guardian, the facility operator was not contacted for further clarification because with gas-firing, and a furnace exhaust temperature in the appropriate NO_x reaction range, the facility is not comparable to the Solvay furnace. There is no evidence from this updated RBLC review that Solvay should alter its opinion that SCR and SNCR are “infeasible” for its application.

Thus, Solvay believes that the updated RBLC control determinations have not added any control technologies not already being considered.